

# Investment Office Roadmap

## Organization Systems & Controls Update for Investment Committee

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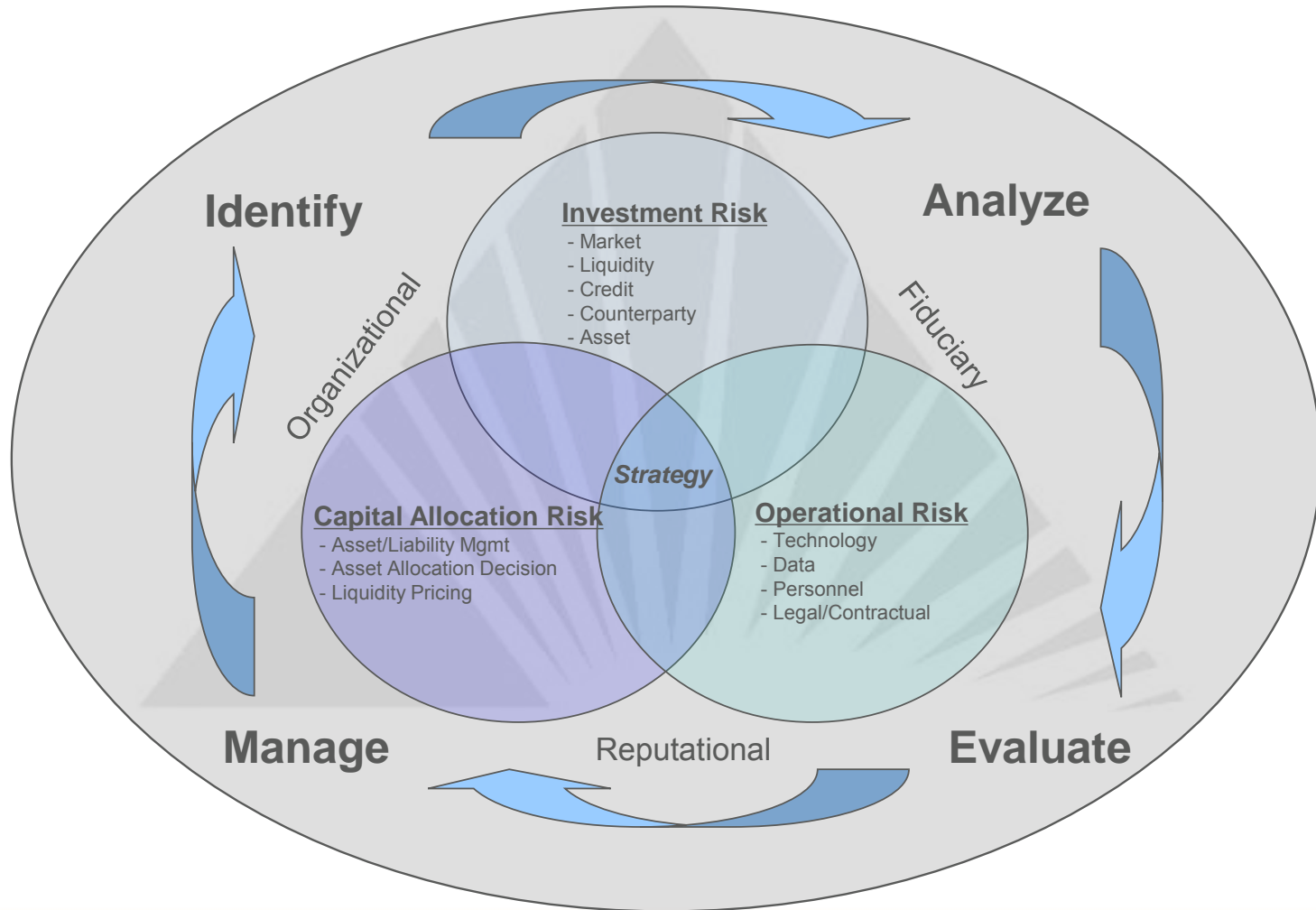
## Context

- **Prior to 2010 – Investment program grew rapidly in scale and complexity ahead of Investment Office infrastructure**
- **2010 – Build foundation for a strong control environment**
  - ✓ Risk Framework
  - ✓ Governance
  - ✓ Risk Assessment
  - ✓ Target Operating Model
- **2011 – 2013 – Deliver asset management industry standard infrastructure and controls**
  - ☐ Roadmap/Strategic Programs
  - ☐ Capabilities
  - ☐ Measures

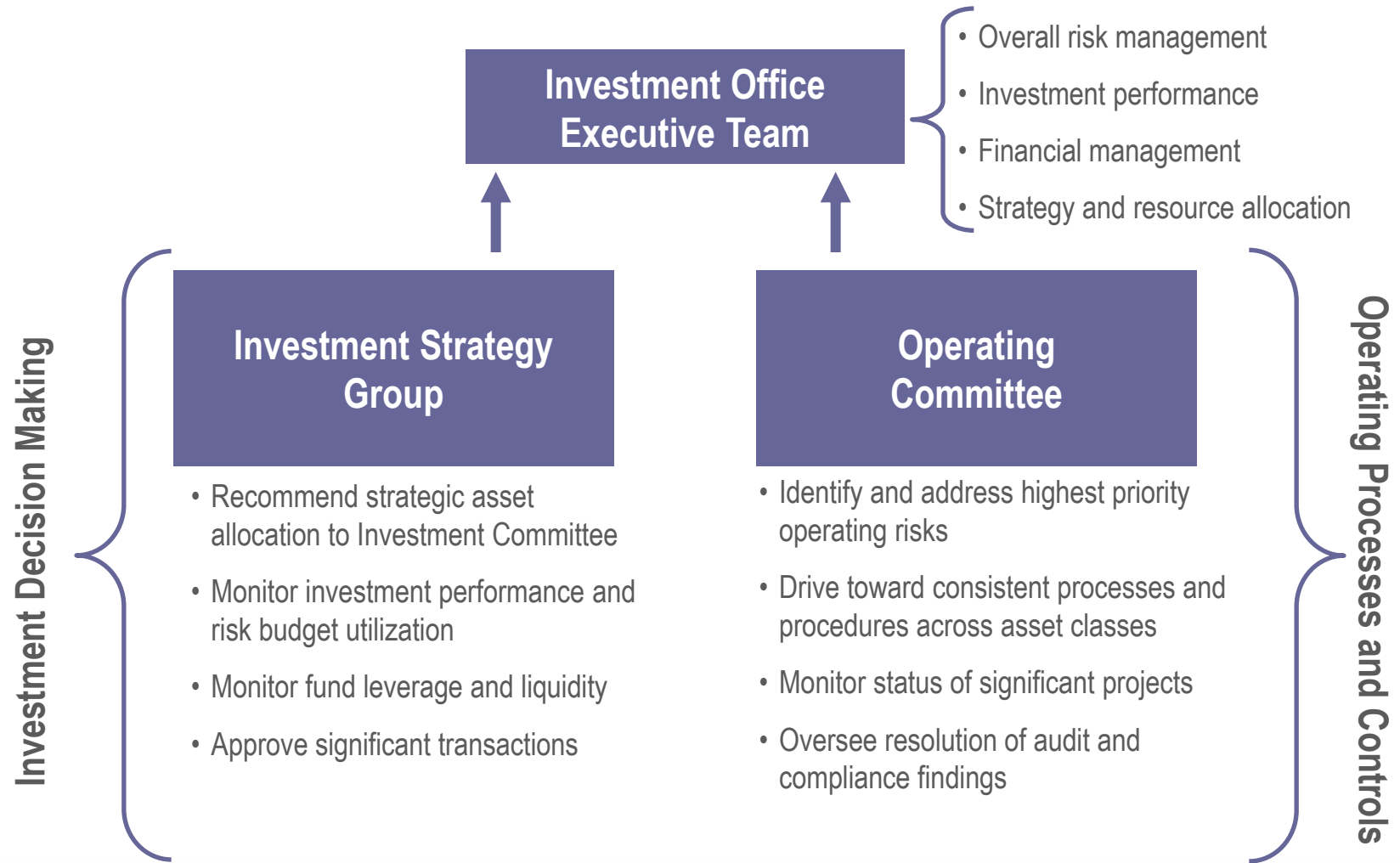
# Today's Agenda

1. Update the Investment Committee on outcome of Investment Office heat map
  - Top INVO risks
2. Update the Investment Committee on Target Operating Model design
  - Gaps from industry best practices
3. Review Organization Systems and Controls Roadmap
  - Prioritized list of major initiatives
  - Capabilities needed

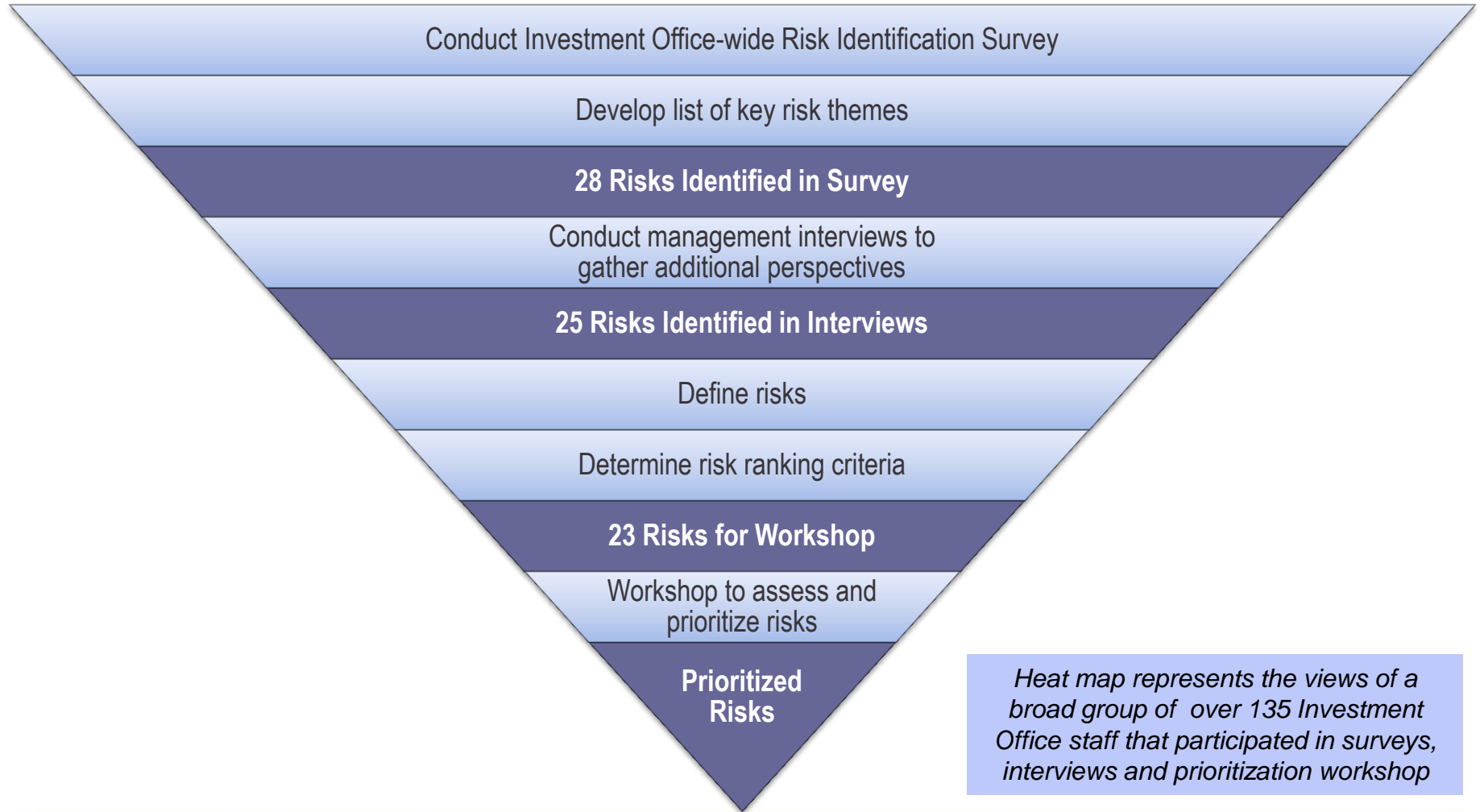
# Investment Office Risk Framework



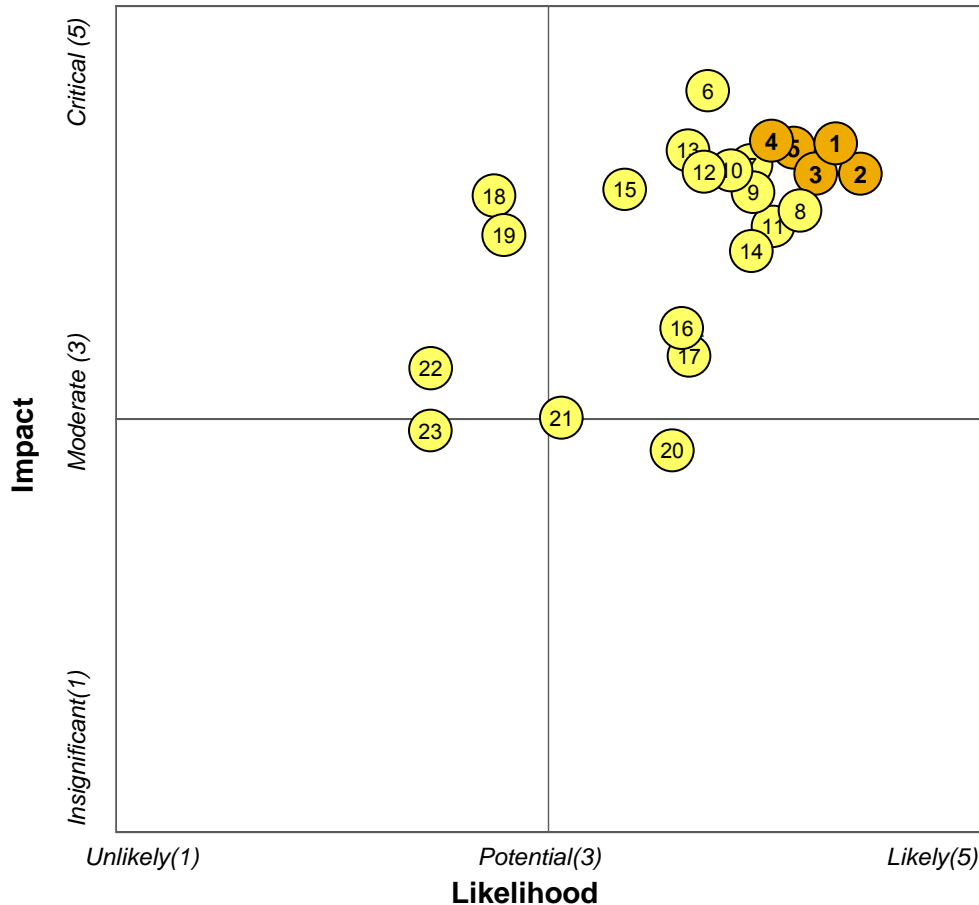
# Investment Office Governance



# Risk Assessment/Heat Map Process



# Risk Assessment/Heat Map Results



NOTE: See appendix for Risk definitions and definitions of Impact and Likelihood rankings.

| Risk Name |   |
|-----------|---|
| 1         | Data Integrity  |
| 2         | Portfolio Data & Analytics                            |
| 3         | Control Environment                                   |
| 4         | Ext. Manager / Partner Selection, Monitoring & Rights |
| 5         | Governance / Stakeholder Support                      |
| 6         | Market / Systemic                                     |
| 7         | Investment Decision Process                           |
| 8         | External Influence                                    |
| 9         | Business Model  |
| 10        | Skills & Capabilities                                 |
| 11        | IT Infrastructure Adequacy                            |
| 12        | Leadership / Direction                                |
| 13        | Asset Allocation Strategy / Portfolio Structure       |
| 14        | Recruiting & Retention                                |
| 15        | Liquidity   |
| 16        | Incentive Alignment                                   |
| 17        | Contract Management                                   |
| 18        | Funding Status  |
| 19        | Ethics / Fraud  |
| 20        | Institutional Knowledge                               |
| 21        | Interest Rates  |
| 22        | Counterparty  |
| 23        | Currency / Foreign Exchange                           |

# Risk Governance

| Investment Strategy Group                                 | Investment Office Exec          | Operating Committee        | Operating Committee        | Board / CalPERS Leadership       |
|---|---------------------------------|----------------------------|----------------------------|----------------------------------|
| Investment / Capital Allocation                           | Human Capital                   | Information Management     | Operational                | Strategic / External             |
| External Manager / Partner Selection, Monitoring & Rights | Skills & Capabilities           | Data Integrity             | Control Environment        | Governance / Stakeholder Support |
| Market / Systemic   | Leadership / Direction          | Portfolio Data & Analytics | IT Infrastructure Adequacy | Market / Systemic                |
| Investment Decision Process                               | Recruiting & Retention          | Institutional Knowledge    | Contract Management        | External Influence               |
| Asset Allocation Strategy / Portfolio Structure           | Incentive Alignment / Structure |                            | Ethics / Fraud             | Business Model                   |
| Liquidity   |                                 |                            |                            | Funding Status                   |
| Interest Rates  |                                 |                            |                            |                                  |
| Counterparty  |                                 |                            |                            |                                  |
| Currency / Foreign Exchange                               |                                 |                            |                            |                                  |

Target Operating Model drills into detail on these risks

Note: Shaded areas represent top five risks.



# Target Operating Model

## Target Operating Model = People, Process, Technology

What functions does the Investment Office perform?

- Functions/Activities

What tools and information do people use to accomplish tasks?

- Technology
- Data

How do people complete tasks?


- Processes
- Controls

How are people organized and how do they interact?

- Organization Model

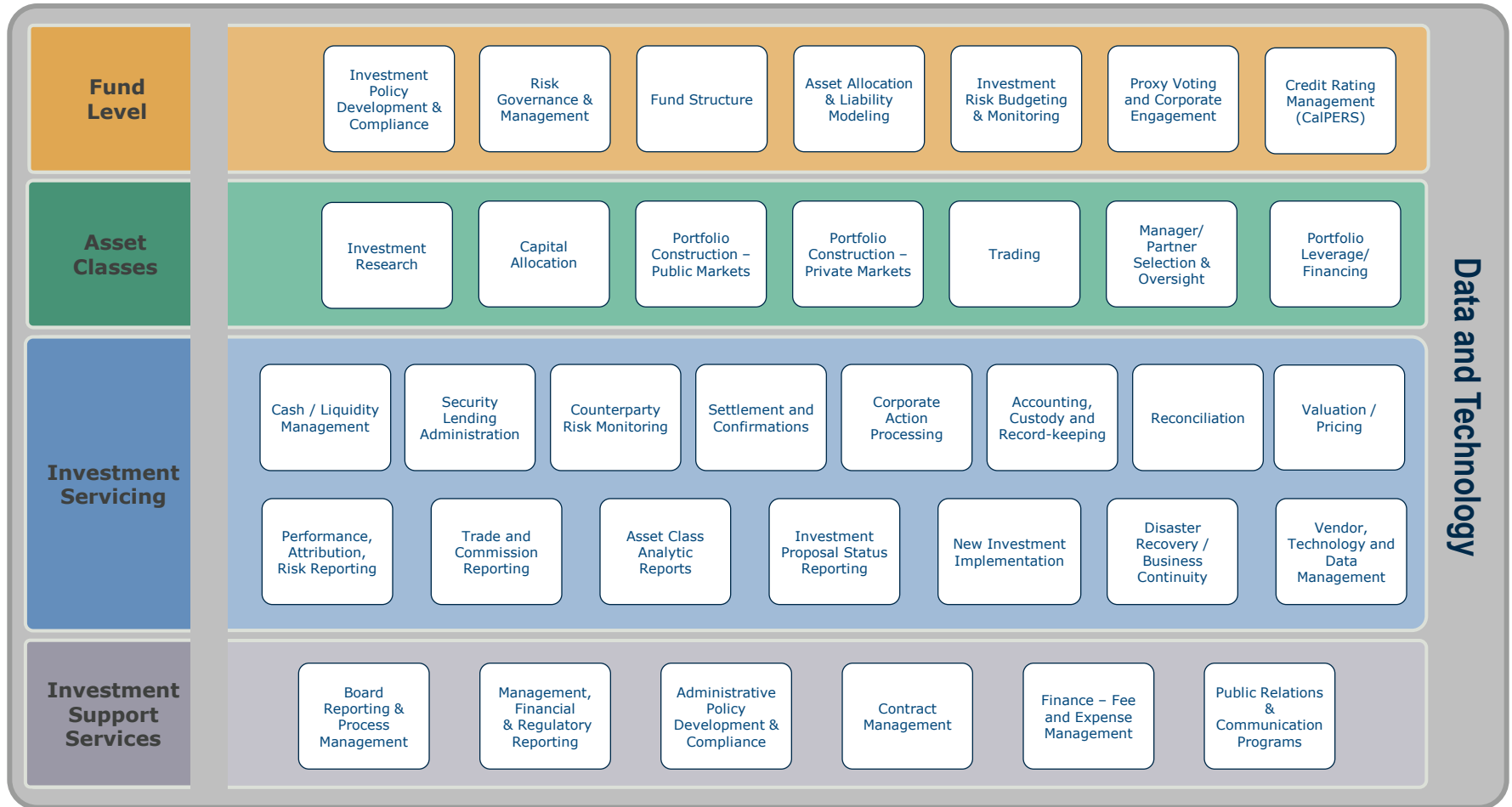
Who does the work?

- Roles/Responsibilities
- Insourced/Outsourced Providers

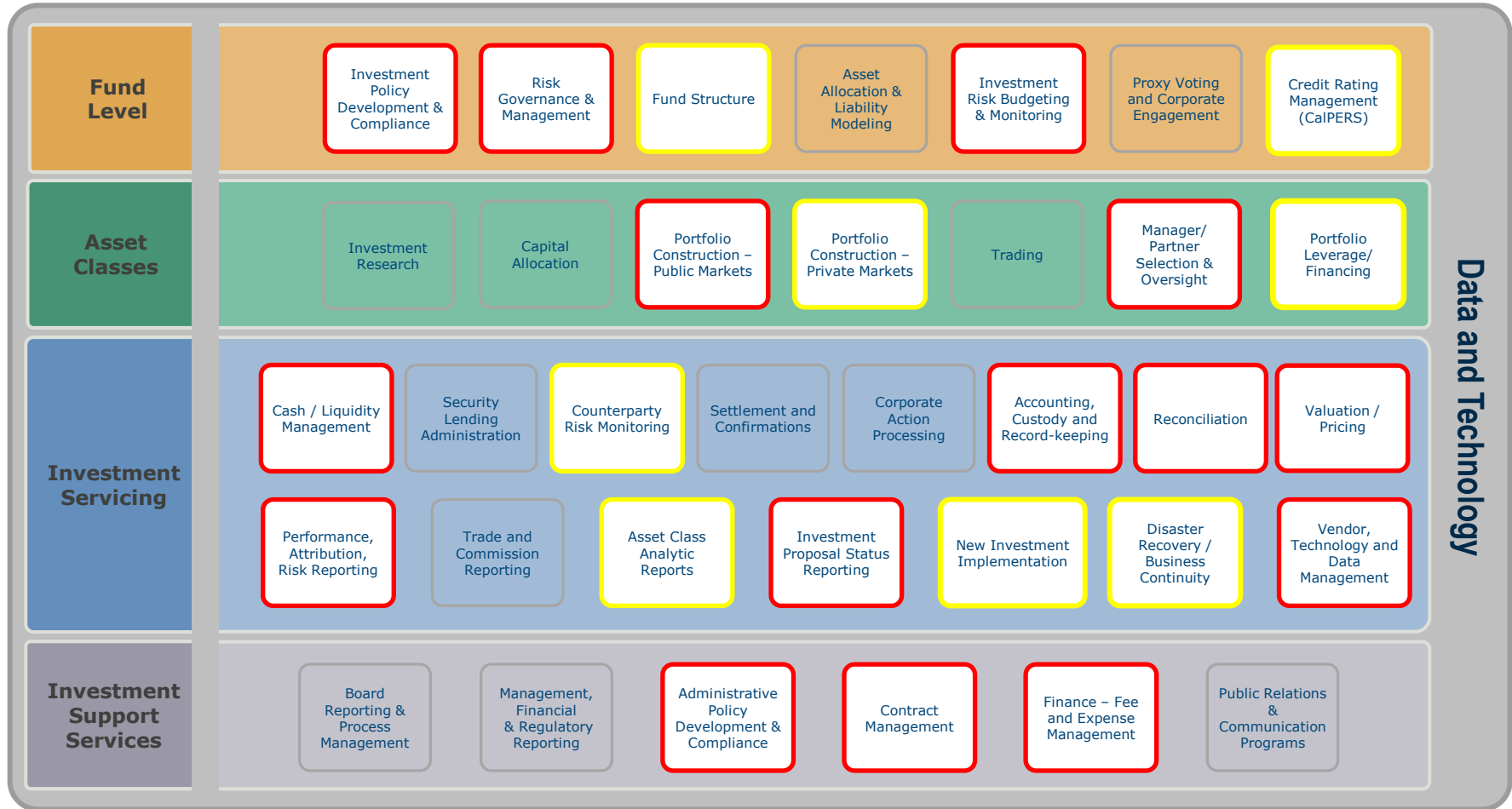


Provides a framework for making decisions about technology and roles of service providers

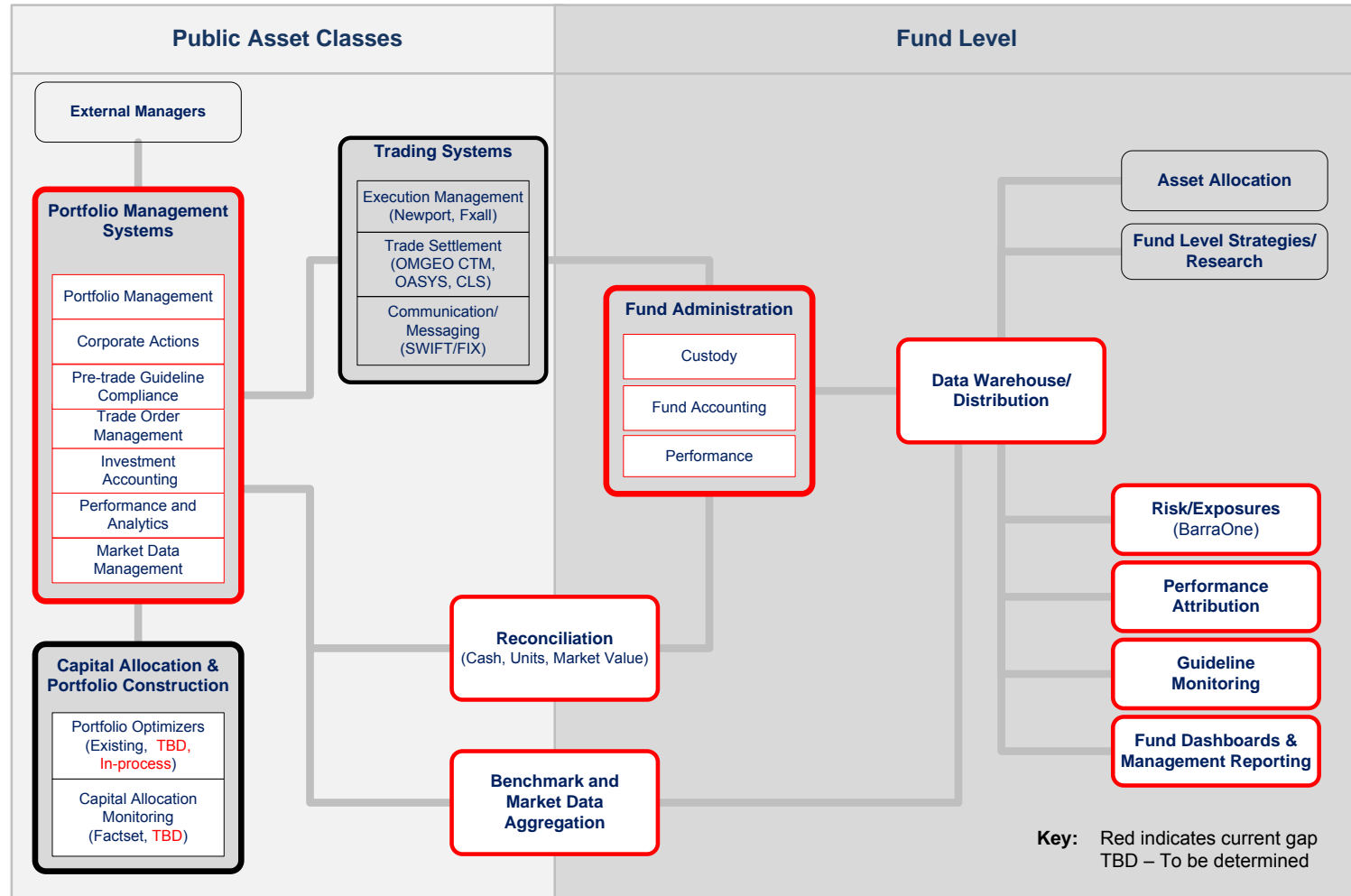
# Standard Investment Functions



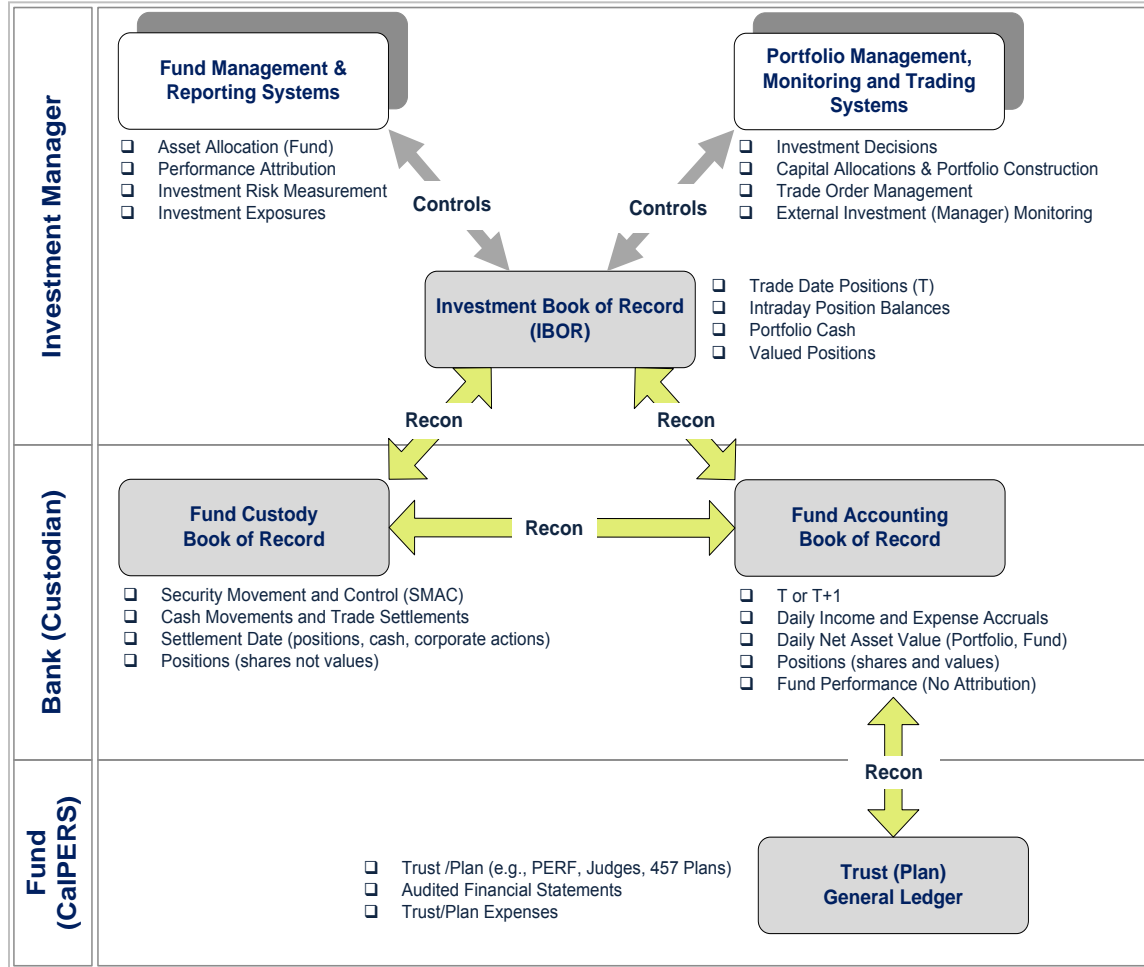
# Investment Office Focus Areas



# Technology – Public Markets Target Model



# Technology – Target Model Books of Record

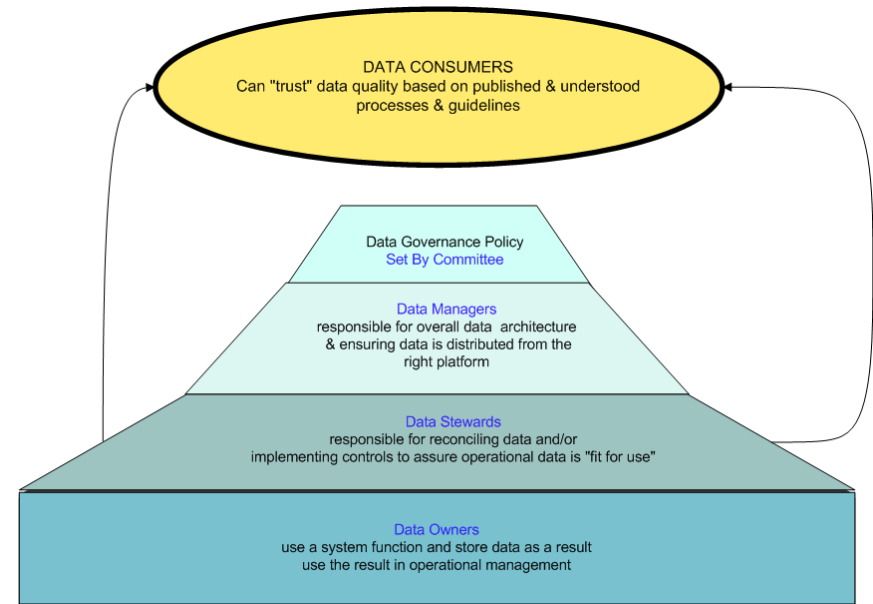


- ❑ **Define and Manage “Books of Record”**
  - ❑ Intended Use
  - ❑ Timeliness - Consider move to Trade Date (T) for Accounting
  - ❑ Accounting and Data Rules (Policies)
- ❑ **Future Investment Books of Record**
  - ❑ Trust G/L - Fiscal
  - ❑ Fund Accounting & Custody - Custodian
  - ❑ Public Markets – TBD
  - ❑ Real Estate – AREIS
  - ❑ ILAC - AREIS or ?
  - ❑ AIM - Private Edge or ?
- ❑ **Define Reconciliations & Control Points**
- ❑ **Manage (Oversee) Reconciliations**

# Data Strategy

- Implement data governance program and processes
- Develop strong practices and associated “rules” for processing accounting data (e.g., closing of books, valuation, cancel/rebook, expense accrual, and NAV reprocessing)
- Eliminate duplicative performance reporting derived from different bases
- Define reconciliation processes for cash, positions, and market values
- Improve oversight of vendor reconciliation processes and establish quality standards
- Identify which data sources are appropriate for what uses, and by whom (“Gold Sources” of data)

## Standard Roles and Accountabilities



# Roadmap: Guiding Principles

- **Move to a daily trade date processing cycle to improve accuracy and timeliness**
- **Share/leverage common systems, data, vendors and operational solutions across asset classes**
- **Establish data standards and controls to ensure timeliness and accuracy of Books of Records**
- **Select outside investment support services to ensure staff focuses on higher value-add functions when:**
  - Advantageous cost-benefit model
  - Service level agreements can be negotiated to manage outcomes
  - Vendor capabilities are superior and fit Investment Office's business model
- **Establish formal accountabilities and processes for managing 3<sup>rd</sup> party service providers**

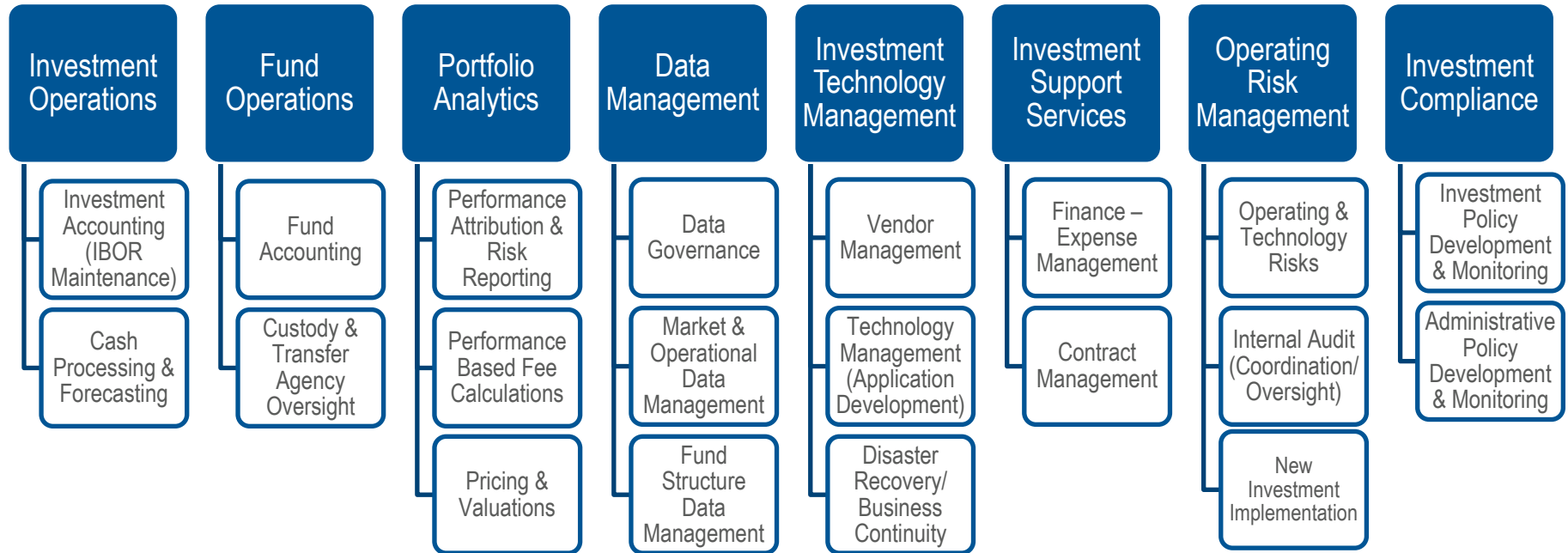
# Proposed Roadmap – Sequence of Major Initiatives

| Initiative   | 2010 | 2011 |   |   |   | 2012 |  |  |  | 2013 |  |  |  |
|--|------|------|---|---|---|------|--|--|--|------|--|--|--|
| PM2: “Public Markets Portfolio Management” (formerly IEPC) | *    |      |   |   |   |      |  |  |  |      |  |  |  |
| Custody, Fund Accounting & Performance                     | *    |      |   |   |   |      |  |  |  |      |  |  |  |
| Investment Risk Management                                 | *    |      |   |   |   |      |  |  |  |      |  |  |  |
| Contract & Vendor Management                               |      |      |   |   |   |      |  |  |  |      |  |  |  |
| Administrative Policies & Monitoring                       |      |      |   |   |   |      |  |  |  |      |  |  |  |
| Manager Selection & Monitoring                             |      |      |   |   |   |      |  |  |  |      |  |  |  |
| Finance / Expense Management                               |      |      |   |   |   |      |  |  |  |      |  |  |  |
| Operating Risk Governance & Management                     |      | *    |   |   |   |      |  |  |  |      |  |  |  |
| Fund Structure & Fund Expenses                             |      | *    |   |   |   |      |  |  |  |      |  |  |  |
| Investment Policy Development & Monitoring                 | *    | *    |   |   |   |      |  |  |  |      |  |  |  |
| Public Records Request Procedures                          |      |      |   |   |   |      |  |  |  |      |  |  |  |
| Cash / Liquidity Management                                | *    | *    | * |   |   |      |  |  |  |      |  |  |  |
| Pricing / Valuation  | *    | *    | * |   |   |      |  |  |  |      |  |  |  |
| Technology Management                                      | *    | *    | * |   |   |      |  |  |  |      |  |  |  |
| Data Services (Governance)                                 | *    | *    | * | * |   |      |  |  |  |      |  |  |  |
| Private Assets IBOR & Accounting                           |      |      |   |   |   |      |  |  |  |      |  |  |  |
| Performance Attribution & Analytics                        | *    | *    | * | * | * | *    |  |  |  |      |  |  |  |
| CRM - Salesforce Expansion                                 |      |      |   |   |   |      |  |  |  |      |  |  |  |
| Records Retention & Document Management                    |      |      |   |   |   |      |  |  |  |      |  |  |  |

\* incremental and / or targeted work underway



# Operations & Control Capability Needs



*2011/12 Budget Request begins to address gaps*

## Next Steps

- **Implement 2011/12 Top Technology Priorities**
  - Public Markets portfolio management and Investment Book of Record
  - Public Markets fund accounting and custody
  - Investment risk management system
- **Internal Capabilities Needed → 2011/12 Budget Request**
- **Develop operating risk measures**
- **Fully develop and cost three-year plan**
  - Identify efficiency/funding opportunities

# Appendix

- **CalPERS Investment Office Risk Definitions & Rankings**
- **Definitions for Risk Ranking**
  - Impact Criteria
  - Likelihood Criteria
- **Proposed Objectives for Initiatives**

# CalPERS Investment Office Risk Definitions & Rankings

| Rank | Risk Name  | Risk Ranking |
|------|--|--------------|
| 1    | <b>Data Integrity:</b> <i>Lack of timely, reliable and high-quality data to perform analyses and drive appropriate action and decisions</i>  | 18.9         |
| 2    | <b>Portfolio Data &amp; Analytics :</b> <i>Lack of data, information or insight concerning existing or potential holdings (public or private) needed to support capital allocation decisions and monitoring of portfolio performance</i>   | 18.9         |
| 3    | <b>Control Environment:</b> <i>Violation of existing policy by employees or partners; or lack of processes or procedures to ensure compliance with existing policies; or lack of appropriate separation of duties and effective controls in operating processes</i>                          | 18.1         |
| 4    | <b>External Manager / Partner Selection, Monitoring &amp; Rights:</b> <i>Inability to select, oversee and structure contracts and incentives with external managers to deliver results that satisfy the organization's objectives and allow for mitigation of potential investment risks</i> | 17.6         |
| 5    | <b>Governance / Stakeholder Support :</b> <i>Inability to align key stakeholders (e.g., management, Board, members, CalPERS enterprise, and consultants) around strategic objectives for Investment Office and to ensure stakeholder support for the execution of those objectives</i>       | 17.6         |
| 6    | <b>Market / Systemic:</b> <i>Significant and / or unexpected change in investment performance driven by market factors</i>   | 17.5         |
| 7    | <b>Investment Decision Process:</b> <i>Lack of a comprehensive investment decision making framework and process that ensures appropriate cross-functional discussion, input, action, and review and that delineates clear and consistent roles and responsibilities</i>                      | 16.8         |
| 8    | <b>External Influence:</b> <i>Lack of ability to execute activities that support long-term strategic goals and investment performance objectives due to undue influence by or potential influence by external stakeholders</i>   | 16.8         |
| 9    | <b>Business Model:</b> <i>Inability, as a state agency, to operate, compete and build a reputation as a world class investment manager</i>   | 16.4         |
| 10   | <b>Skills &amp; Capabilities:</b> <i>Lack of key business, investment management and / or technical expertise necessary to run the organization and ensure the appropriate division of in-house vs. outsourcing of skills, functions and expertise</i>                                       | 16.4         |
| 11   | <b>IT Infrastructure Adequacy:</b> <i>Lack of appropriate, integrated information management systems to support timely and accurate collection / analysis of data and execution of business processes</i>  | 16.0         |
| 12   | <b>Leadership / Direction:</b> <i>Inability to maintain clear and consistent direction from senior management regarding key priorities, activities and objectives; inability to implement functioning, governance / decision-making structure within Investment Office</i>                   | 16.0         |

# CalPERS Investment Office Risk Definitions & Rankings

| Rank | Risk Name  | Risk Ranking |
|------|--|--------------|
| 13   | <b>Asset Allocation Strategy / Portfolio Structure:</b> <i>Lack of ability to effectively and advantageously execute timely strategic and tactical asset allocation decisions that improve fund performance and reduce volatility</i>  | 15.9         |
| 14   | <b>Recruiting &amp; Retention:</b> <i>Inability to identify, attract, select, hire and retain appropriately skilled and experienced employees to execute the organization's activities and maintain a stable workforce</i>   | 15.2         |
| 15   | <b>Liquidity:</b> <i>Inability to generate, maintain or access capital necessary to fund operations and meet obligations in either the short term (e.g. capital calls) or long term (e.g. retirement benefits); including the inability to convert certain investments to cash without significant loss of value</i> | 13.9         |
| 16   | <b>Incentive Alignment:</b> <i>Misalignment of individual and/or team (internal) performance expectations with the overall goals and performance objectives of the organization, portfolio or system</i>   | 12.6         |
| 17   | <b>Contract Management:</b> <i>Inability to identify, catalog and manage contractual agreements in a consistent and effective manner in order to ensure compliance and monitor vendor performance</i>  | 12.2         |
| 18   | <b>Funding Status:</b> <i>Cessation of or significant change to the current defined benefit pension system in California</i>   | 11.5         |
| 19   | <b>Ethics / Fraud:</b> <i>Improper behavior or unlawful action taken in pursuit of personal gain by employee(s) or others associated with or acting on behalf of the organization</i>  | 10.9         |
| 20   | <b>Institutional Knowledge:</b> <i>Inability to design, maintain and execute processes and systems to ensure the documentation, transfer and institutionalization of business activities to ensure consistency and sustainability of operations</i>  | 10.1         |
| 21   | <b>Interest Rates:</b> <i>Significant and / or unexpected change in interest rates associated with the organization's existing assets</i>  | 9.3          |
| 22   | <b>Counterparty:</b> <i>Default on existing obligations by financial intermediaries (e.g. brokers, banks, fund managers), suppliers or bond issuers</i>  | 8.0          |
| 23   | <b>Currency / Foreign Exchange:</b> <i>Significant and / or unexpected change in the value of the US dollar relative to foreign currencies held in or affecting the portfolio's other investments</i>  | 7.3          |

# Definitions for Risk Ranking

| Rating                           | IMPACT CRITERIA   |   |  |
|----------------------------------|---|---|--|
|                                  |   |   |  |
| <b>5</b><br><i>Critical</i>      | <ul style="list-style-type: none"> <li>• &gt;50 bps ( &gt; \$1BN)</li> </ul>  | <ul style="list-style-type: none"> <li>• Significant Stakeholder Reaction</li> <li>• Loss of Key Investment Opportunities</li> <li>• Intl / National Press Coverage</li> <li>• Sudden Loss of Multiple Investment Office Leaders</li> </ul> | <ul style="list-style-type: none"> <li>• Federal / State Action</li> <li>• Significant Legal Penalty</li> <li>• Loss of Tax-Exempt Status</li> <li>• Breach of Fiduciary Duties</li> </ul> |
| <b>4</b><br><i>Major</i>         | <ul style="list-style-type: none"> <li>• 30-50 bps (\$600MM-1BN)</li> </ul>   |   |  |
| <b>3</b><br><i>Moderate</i>      | <ul style="list-style-type: none"> <li>• 10-30 bps (\$200MM-600MM)</li> </ul> | <ul style="list-style-type: none"> <li>• Increased Stakeholder Scrutiny</li> <li>• Limitations in Investment Opportunities</li> <li>• Regional Press Coverage</li> <li>• Loss of Key Investment Professionals</li> </ul>                    | <ul style="list-style-type: none"> <li>• Federal / State Scrutiny</li> <li>• Modest Legal Penalty</li> <li>• Potential Breach of Fiduciary Duties</li> </ul>                               |
| <b>2</b><br><i>Minor</i>         | <ul style="list-style-type: none"> <li>• 1-10 bps (\$20-200MM)</li> </ul>     |   |  |
| <b>1</b><br><i>Insignificant</i> | <ul style="list-style-type: none"> <li>• &lt;1 bps (&lt; \$20MM)</li> </ul>   | <ul style="list-style-type: none"> <li>• Limited Stakeholder Interest / Inquiry</li> <li>• Minimal (If Any) Opportunity Impact</li> <li>• Limited (If Any) Press Coverage</li> </ul>  | <ul style="list-style-type: none"> <li>• No Federal / State Scrutiny</li> <li>• No Legal Penalty</li> <li>• No Breach of Fiduciary Duties</li> </ul>                                       |

# Definitions for Risk Ranking

| Rating                       | LIKELIHOOD CRITERIA  |
|------------------------------|--|
| <b>5</b><br><i>Likely</i>    | <ul style="list-style-type: none"> <li>• Already occurring or expected to occur within the time horizon (1-2 years)</li> <li>• Controls either are not working or may not exist</li> <li>• Risk affects a HIGH number of transactions, processes and systems</li> <li>• Limited staff to address risk; staff available has limited competency to address risk</li> </ul> |
| <b>4</b>                     |  |
| <b>3</b><br><i>Potential</i> | <ul style="list-style-type: none"> <li>• May occur within the time horizon (1-2 years)</li> <li>• Controls may not be preventative but are detective</li> <li>• Risk affects a MEDIUM number of transactions, processes and systems</li> <li>• Limited staff to address risk; staff available has some competency to address risk</li> </ul>                             |
| <b>2</b>                     |  |
| <b>1</b><br><i>Unlikely</i>  | <ul style="list-style-type: none"> <li>• Not expected to occur within the time horizon (1-2 years)</li> <li>• Controls are appropriately preventative and detective</li> <li>• Risk affects a LOW number of transactions, processes and systems</li> <li>• Staff in place to address risk; staff available has high competency to address risk</li> </ul>                |

## Proposed Objectives for Initiatives

| Initiative  | Priority | Scope and Objectives   |
|---|----------|--|
| PM <sup>2</sup> : “Public Markets Portfolio Management” (formerly IEPC) | High     | <ul style="list-style-type: none"> <li>Implement accounting and portfolio management solution for Internal Equity and External Managers</li> <li>Establish an Investment Book of Record for Public Assets and Portfolio Management and Monitoring</li> </ul>   |
| Custody, Fund Accounting & Performance                                  | High     | <ul style="list-style-type: none"> <li>Improve Custodian service levels</li> <li>Improve Fund Accounting service levels including upgrade to T/T+1 NAVs</li> <li>Improve Fund Performance reporting services</li> <li>Establish Investment Office oversight roles and responsibilities to manage services</li> </ul>   |
| Investment Risk Management  | High     | <ul style="list-style-type: none"> <li>Implement BarraOne as a Fund Risk measurement solution</li> <li>Vet the capabilities of BarraOne to adequately reflect risk in Private Asset Classes; consider complementary solutions</li> </ul>   |
| Contract & Vendor Management  | High     | <ul style="list-style-type: none"> <li>Define contracting procedures &amp; standards for external investment (money) managers to reduce effort and elapsed time</li> <li>Develop capabilities to manage external service providers (e.g., custodian, analytic services, market data) to align service levels with Investment Office needs and control costs</li> </ul> |
| Administrative Policies and Monitoring                                  | High     | <ul style="list-style-type: none"> <li>Establish administrative policies (e.g., travel, expense, contracting) and procedures that are efficient and aligned with Investment Office functions and objectives (e.g., manager monitoring, training)</li> </ul>  |
| Manager Selection and Monitoring  | High     | <ul style="list-style-type: none"> <li>Establish Investment Office-wide standards for managing external managers (selection, deal negotiation, monitoring) including performance objectives (MBOs)</li> </ul>  |
| Operating Risk Governance & Management                                  | High     | <ul style="list-style-type: none"> <li>Establish a Risk Governance and Management program to assure operating risks are identified and remediated</li> </ul>   |
| Fund Structure & Fund Expenses  | Medium   | <ul style="list-style-type: none"> <li>Revise the structure of PERF and Affiliate funds to standardize and deliver effective portfolio management, custody, fund accounting and transfer agent services</li> <li>Define policies and procedures for ensuring appropriate recognition of fund expenses</li> </ul>   |



## Proposed Objectives for Initiatives

| Initiative   | Priority | Scope and Objectives   |
|--|----------|--|
| Investment Policy Development and Monitoring                   | High     | <ul style="list-style-type: none"> <li>Establish investment policy monitoring processes that assure internal and external managers conform with investment guidelines</li> </ul>   |
| Finance / Expense Management                                   | High     | <ul style="list-style-type: none"> <li>Implement a finance/expense management solution to ensure effective management of Investment Office expense budgets</li> </ul>  |
| Public Records Request Procedures                              | Medium   | <ul style="list-style-type: none"> <li>Improve/establish policies and procedures to respond to Public Record Act (PRA) requests</li> </ul>   |
| Cash / Liquidity Management                                    | Medium   | <ul style="list-style-type: none"> <li>Define policies and implement procedures for processing cash movements and for cash forecasting to assure accuracy and better manage fund liquidity</li> <li>Explore use of Aladdin for cash management</li> </ul>        |
| Pricing / Valuation  | Medium   | <ul style="list-style-type: none"> <li>Establish a pricing/valuation function to assure Investment Office valuations conform to the basis used for representing fair value and performance reporting</li> </ul>  |
| Technology Management  | High     | <ul style="list-style-type: none"> <li>Establish a technology management function to assure technology services supplied by CalPERS and vendors are effective</li> </ul>   |
| Data Services (Governance)                                     | High     | <ul style="list-style-type: none"> <li>Establish a Data Governance and Data Management Function to assure the integrity and availability of investment data and manage costs (e.g., SEDOL, CUSIP, market data) - Refer to Data Strategy</li> </ul>               |
| Private Assets IBOR (Investment Book of Record) and Accounting | Medium   | <ul style="list-style-type: none"> <li>Evaluate alternatives for AIM (e.g., LP Capital, Private Edge) and ILAC for portfolio monitoring</li> <li>Implement (upgrade) Investment Book of Record (IBOR) and portfolio monitoring tools for AIM and ILAC</li> </ul> |
| Performance Attribution and Analytics                          | High     | <ul style="list-style-type: none"> <li>Implement a performance attribution solution</li> <li>Manage the delivery and support of other investment analytics (e.g., Risk Measurement, Fixed Income Analytics, Exposures)</li> </ul>                                |
| CRM – Salesforce Expansion                                     | Medium   | <ul style="list-style-type: none"> <li>Deploy Salesforce as an Investment Office standard for Contact/Client Relationship Management (CRM)</li> </ul>  |
| Records Retention and Document Management                      | Medium   | <ul style="list-style-type: none"> <li>Establish policies and procedures for defining “records” and managing archival</li> <li>Implement a document management solutions</li> </ul>  |